

# Guitar Tuner

Rishabh Kanwar (140953360)

Pratyay Amrit (140953430)

# Objective

- To build an application for Android which can be used to tune musical instruments.
- The application takes sound as input through the device microphone and processes it to identify which note is being played, and how accurately the note matches to actual note frequency.
- To develop a UI that is easy to read and understand.
- To develop an application with minimal human interaction, as the user will be handling an instrument at the same moment.

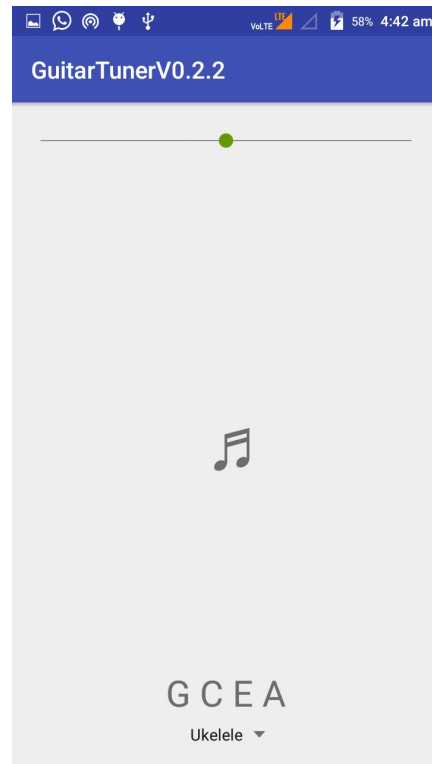
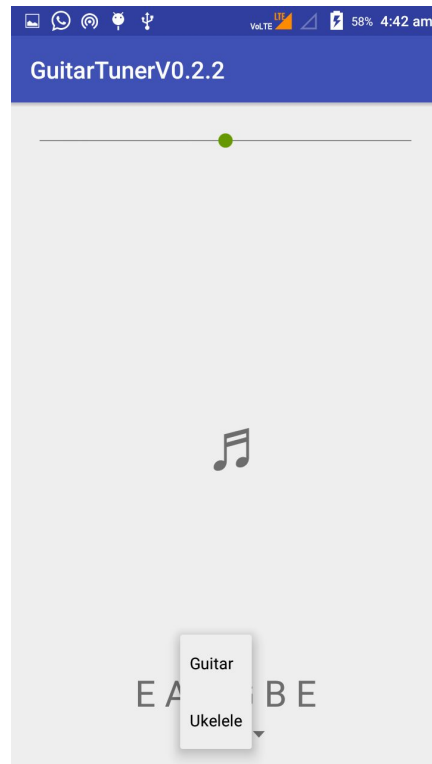
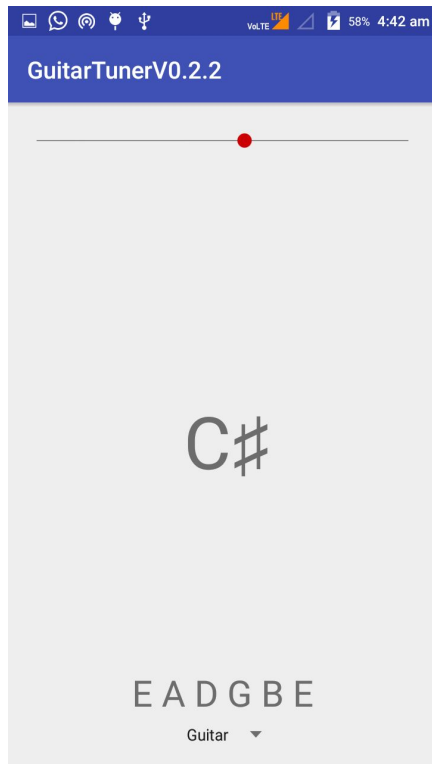
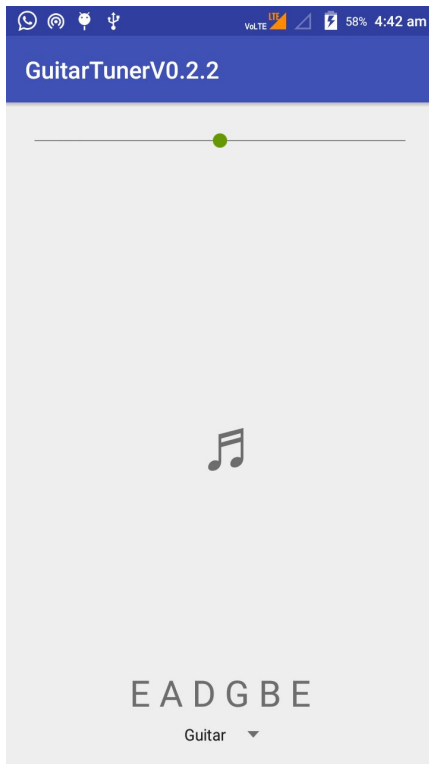
# Methodology

- The application uses the Yin Algorithm to calculate the fundamental frequency of sound input. This algorithm is implemented using the java library called 'TarsosDSP' by 'JorenSix' on GitHub.
- The frequency generated by the Yin ALgorithm is passed to another library used in the project 'Android-Guitar-Tuner' by 'chRyNaN' on GitHub. The library performs a binary search on an indexed array of musical notes and matches them with the received frequency to identify the note being played.
- The note identified is displayed on the center of the screen with a meter on top to represent accuracy. The accuracy is calculated by considering the difference between the found note frequency and the frequency of input sound signal.

# Methodology

- A spinner on the bottom contains instruments (currently Guitar and Ukelele, but scalable). When an instrument is selected, it's standard tuning specification is displayed on the screen. Guitar is selected by default.

# User Interface



# Conclusion

- With the knowledge of sound processing algorithms, one can develop an application to tune musical instruments.
- This application can be scaled to any number of musical instruments since all of them play a standardized set of frequencies that are identified as musical notes.